



Higher urinary iodine levels correlates with lower systolic blood pressure in Chilean schoolchildren.



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Background

- Urinary iodine concentrations in Chilean schoolchildren are the highest in South America and it may be correlated with excessive salt intake.
- Adequate iodine nutrition is defined by median urinary iodine concentrations between 100-199 ug/l by the WHO; concentrations above this range define iodine intake above the requirements.
- There is scarce population data from iodine status and its correlation with cardiovascular risk factors in children.

Aim

- The objective of this study is to evaluate the effect of iodine on blood pressure (BP) and cardiovascular risk factors, despite salt intake

Methods

- Cross-sectional study. Seventy schoolchildren in Santiago, Chile were recruited (54.3% female, median age 13 [12.1- 16.1]).
- Anthropometry, BP and pubertal stage were evaluated. A salt questionnaire (qualitative and quantitative) was carried out; salt intake was ad libitum. The BP index was determined using the observed BP/50th percentile BP level for gender, age, and stature using the normal values reported.
- We measured ultra-sensitive C Reactive Protein (hsCRP), glucose, triglycerides, LDL, creatinine, TSH, free T4, aldosterone and plasma renin activity [ARP] in blood samples. Iodine, creatinine, microalbuminuria and sodium were determined in 24-hour urinary samples and urinary iodine/urinary sodium ratio was calculated.
- Pearson correlation was performed for continuous variables; Mann Whitney test for independent samples.

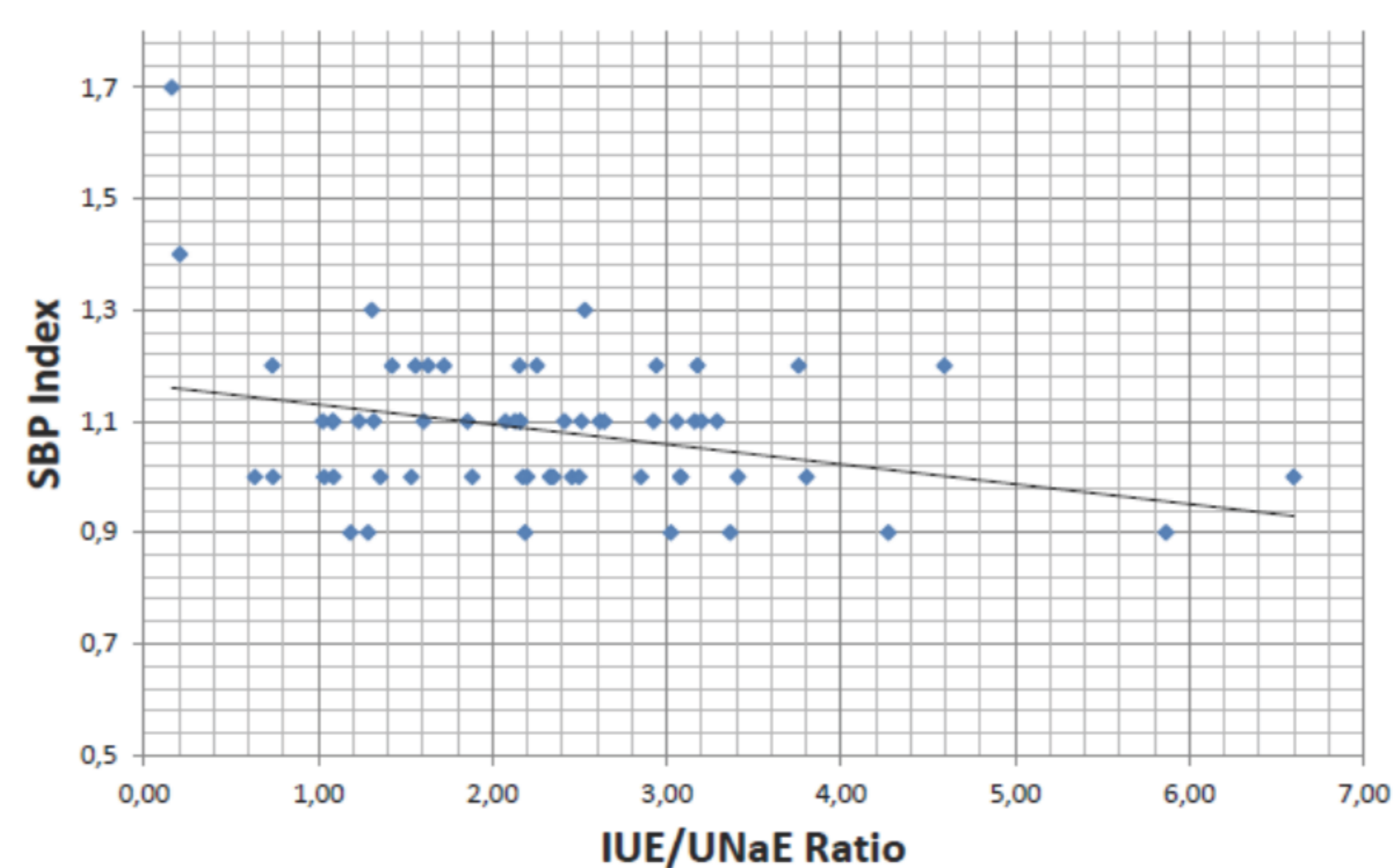
Results

- Urinary iodine excretion (UIE) (Medium; [interquartile range Q1-Q3]) was 298.5 ug/l [168.5- 416.8].
- 65.7% of the patients presented iodine levels above requirements.
- A negative correlation was observed between urinary iodine and age ($r = -0.4$; $p = 0.001$), systolic BP ($r = -0.3$; $p = 0.01$), even when corrected for sodium excretion ($r = -0.32$; $p = 0.01$). No statistically significant correlation was observed between urinary iodine and hsCRP [$p = 0.13$], glycemia [$p = 0.3$], cholesterol [$p = 0.93$], triglycerides [$p = 0.76$], LDL [$p = 0.34$], TSH [$p = 0.98$], aldosterone [$p = 0.59$], ARP [$p = 0.19$], neither with diastolic blood pressure [$p = 0.09$].

Table 1. Clinical characteristics of the participants.

N	70
Females, n (%)	38 (54.3%)
Age (years) ^b	13.4 (12.1- 16.1)
BMI (SDS)	1.32 ±1.05
Waist circumference (cm)	80.8 ±10.7
Fat (%)	27.85 ±11.28
SBP index	1.08 ±0.13
DBP index	1.14 ±0.19
Tanner distribution 1/2/3/4/5	0/0/7/5/17
Birth weight (gr) ^a	3322.54 ±626.3
Birth length (cm) ^a	49.47 ±2.3
UNaE (Urinary Na) (mEq/24h)	123.53 ±53.3
UIE/UNaE ratio	1.16 ±2.22

Figure 1. Pearson correlation between UIE/ UNaE ratio and SBP Index



Partial R= -0.32; p=0.01

Table 2. Thyroid function of the participants.

N	70
TSH (MUI/ml) ^b	2.55 (0.72- 10.98)
(RV: 0.7 a 5.7)	
Free T4 ^a	1.28 ±0.18
(RV: 1 a 2 ng/dl)	
Anti-peroxidase (+)	6 (8.57%)
(RV: <5.61)	
Anti- thyroglobulin (+)	4 (5.71%)
(RV: <4.11)	

Results are presented as:

^a Mean and standard deviation

^b Median and inter quartile range

Conclusions

- Schoolchildren in Santiago de Chile have much higher urinary iodine concentrations than recommended by the WHO, and it decreases with age.
- Higher urinary iodine/urinary sodium ratio correlated with lower systolic BP, which could represent a cardiovascular protective factor that has not yet been studied extensively.

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